Black Pond Questions and Answers, 2015 CSLAP

Q1. What is the condition of our lake this year?

A1. Water quality conditions in Black Pond were slightly less favorable than usual in 2015. Although no shoreline algae blooms were reported, overall algae levels were again higher than usual in 2015, due to higher phosphorus readings. However, recreational assessments remain favorable.

Q2. Is there anything new that showed up in the testing this year?

A2. Chloride sampling results were typical of lakes with low to moderate impacts from road salt runoff, and no biological impacts have been reported or measured.

Q3. How does the condition of our lake this year compare with other lakes in the area?

A3. Black Pond has much lower water clarity, and much higher algae and nutrient levels, than a typical Long Island lake, although no shoreline blooms were reported.

Q4. Are there any trends in our lake's condition?

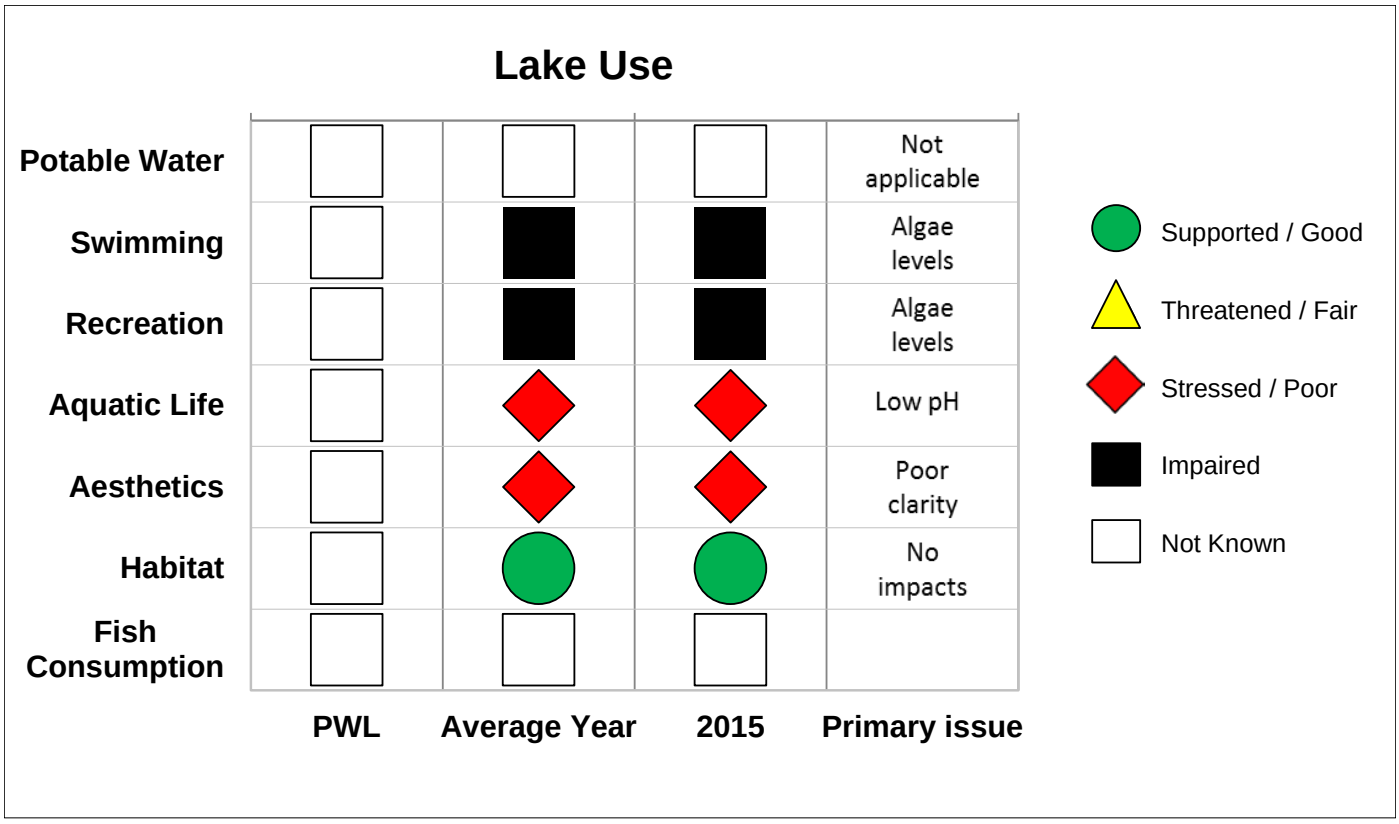
A4. Algae levels have increased significantly in recent years, perhaps consistent with a recent rise in phosphorus and nitrogen. NOx readings have decreased over this period.

Q5. Should we be concerned about the condition of our lake? Are we close to a tipping point?

A5. Black Pond appears to be susceptible to algae blooms, but these have not been reported or measured. An additional threat to the lake is invasive species, particularly since invasive plants and animals are found in nearby lakes.

Q6. Are any actions indicated, based on the trends and this year's results?

A6. Individual stewardship activities such as pumping your septic system, growing a buffer of native plants next to the water bodies, and reducing erosion from shoreline properties and runoff into the lake will help to maintain highly favorable water quality conditions by reducing nutrient and sediment loading to the lake. Visiting boats (if any are used on the lake) should be inspected to reduce the risk of new invasive species, since nearby lakes harbor several invasive plants not found in the lake

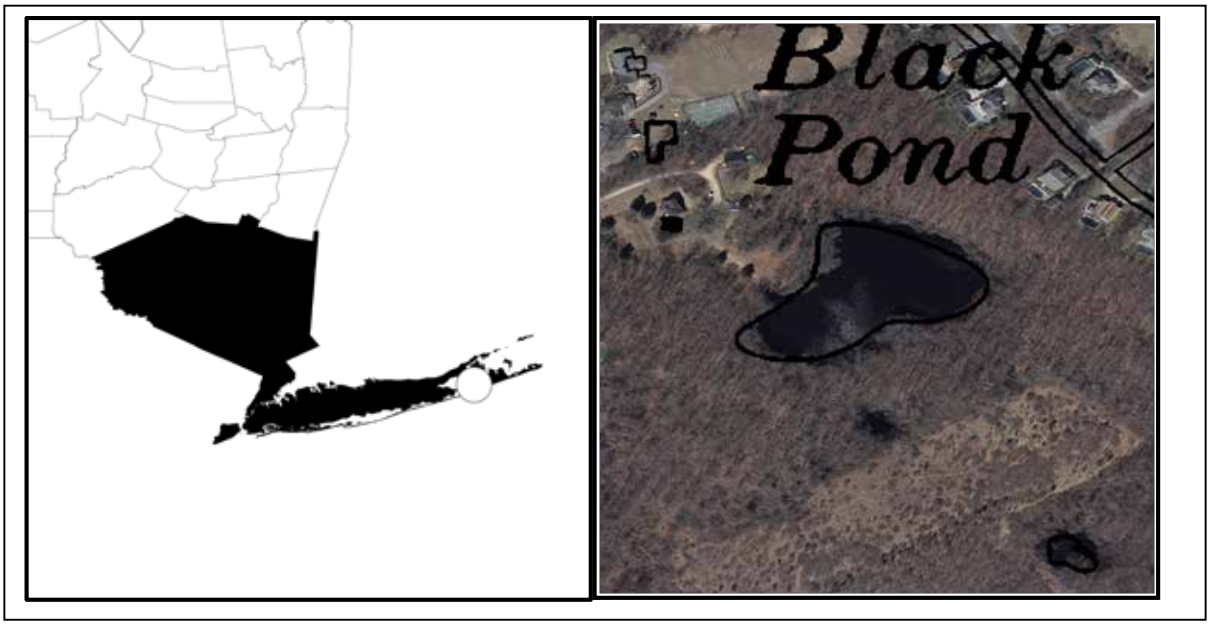


CSLAP 2015 Lake Water Quality Summary:
Black Pond

General Lake Information

Location	Town of Southampton
County	Suffolk
Basin	Long Island Sound/Atlantic Ocean
Size	1.1 hectares (2.7 acres)
Lake Origins	Natural
Watershed Area	50 hectares (123.5 acres)
Retention Time	0.04 years
Mean Depth	0.5 meters
Sounding Depth	1 meters
Public Access?	no
Major Tributaries	no named tribs
Lake Tributary To…	no named outlet
WQ Classification	C (non-contact recreation = boating, angling)
Lake Outlet Latitude	40.951
Lake Outlet Longitude	-72.297
Sampling Years	2008-2013, 2015
2015 Samplers	Dai Dayton, Tom Hensler and Jean Dodds
Main Contact	Dai Dayton

Lake Map



Background

Black Pond is a 3 acre, class C lake found in the Town of Southampton in Suffolk County, in the Long Island region of New York State. It was first sampled as part of CSLAP in 2008.

It is one of six CSLAP lakes among the nearly 750 lakes and ponds found in Suffolk County, and one of seven CSLAP lakes among the more than 1150 lakes and ponds in the Atlantic Ocean-Long Island Sound drainage basin.

Lake Uses

Black Pond is a Class C lake; this means that the best intended use for the lake is for non-contact recreation—boating and aesthetics, although the lake may also support contact recreation—swimming and bathing. The lake is not used for swimming or other recreational uses, and there is no public access to the lake.

It is not known whether Black Pond has been stocked through any state fisheries stocking programs, or if any private stocking has occurred.

General statewide fishing regulations are applicable in Black Pond. In addition, there is a year-round open season on bluegill, crappie, pumpkinseed sunfish, trout and yellow perch. There is a size limit of nine inches, and a daily take limit of 15 fish for all of these fish except trout, which has a daily take limit of three. Ice fishing of trout is permitted.

There are no lake-specific fish consumption advisories on Black Pond.

Historical Water Quality Data

CSLAP sampling was conducted on Black Pond from 2008 to 2013, and 2015. The CSLAP reports for each of the past several years can be found on the NYSFOLA website at http://nysfola.mylaketown.com. The most recent CSLAP report and scorecard for Black Pond can also be found on the NYSDEC web page at http://www.dec.ny.gov/lands/77836.html.

Black Pond has not been sampled through any previous NYSDEC monitoring program. It is not known if the lake has been sampled by any organizations associated with the Long Island Greenbelt.

There are no NYSDEC RIBS monitoring sites near Black Pond, and there are no named tributaries to the lake.

Lake Association and Management History

Black Pond is part of the Long Pond Greenbelt complex, along with (among other CSLAP lakes) Lily Pond and Little Long Pond. The Long Pond Greenbelt is an approximately 11-kilometer (7-mile) north-south corridor of ponds, streams, and adjacent upland areas in the Outer Coastal Plain physiographic province. The preservation of land in the Long Pond Greenbelt has been a goal in the master plan for the town of Southampton since 1970. Long Pond Greenbelt is recognized by the New York State Department of State as a Significant Coastal Fish and Wildlife Habitat, and by the U.S. Fish and Wildlife Service as a priority wetland complex under the federal Emergency Wetlands Resources Act of 1986. The New York State Natural Heritage Program, in conjunction with The Nature Conservancy, recognizes several Priority Sites for Biodiversity within the Long Pond Greenbelt complex. Black Pond is classified as B3 - high

biodiversity significance. Other excellent examples of coastal plain pond shore communities occur at Long Pond and Little Long Pond.

Information about the Long Pond Greenbelt can be found at http://library.fws.gov/pubs5/web_link/text/lpg_form.htm.

Summary of 2015 CSLAP Sampling Results

Evaluation of 2015 Annual and Monthly Results Relative to 2006-2013

The summer (mid-June through mid-September) average readings are compared to historical averages for all CSLAP sampling seasons in the "Lake Condition Summary" table, and are compared to individual historical CSLAP sampling seasons in the "Long Term Data Plots – Black Pond" section in Appendix C.

Evaluation of Eutrophication Indicators

Phosphorus and chlorophyll *a* levels were higher than usual in 2015, but this did not translate to lower water clarity readings (however, water clarity has always been extremely low in the lake). The higher nutrient and algae levels have been part of a steady increase in the last several years.

Algae levels increase during the typical summer, a seasonal trend also apparent in 2015, but phosphorus levels do not vary seasonally in a predictable way. Water clarity is consistently low during the summer and normally does not vary seasonally in response to the rise in algae levels. However, water clarity did decrease during the summer in 2015.

The lake can be characterized as *eutrophic,* or highly productive, based on chlorophyll *a*, water clarity and total phosphorus readings (all typical of *eutrophic* lakes). The trophic state indices (TSI) evaluation indicates that each of these trophic indicators are "internally consistent"- that is, changes in any of these indicators can predict changes in the other indicators. Overall trophic conditions are summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Potable Water Indicators

Algae levels are high enough to render the lake susceptible to taste and odor compounds or elevated DBP (disinfection by product) compounds that could affect the potability of the water, although the lake is not classified for use for drinking water and does not sustain any unofficial use for this purpose. Potable water conditions, at least as measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Limnological Indicators

Nitrogen levels, particularly NOx and total nitrogen, were higher than normal in early summer, although ammonia readings were lower than normal in late summer, the latter part of a decreasing trend in recent years. None of the other limnological indicators (pH, conductivity, color, or calcium) has exhibited any long-term trends, and each of these indicators was close to normal in 2013. It is likely that the small changes in most of these indicators have been within the normal range of variability in the lake.

Chloride levels in the 2015 samples, conducted for the first time through CSLAP and cited in Appendix A, ranged from 12 to 14 mg/l. These values are within the lower end of the range of

“moderate” road salt” runoff levels cited by the New Hampshire DES, although they are well below the state potable water quality standard of 250 mg/l and below range of values found in a number of NYS lakes.

Overall limnological conditions are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Biological Condition

Phytoplankton, macrophyte, zooplankton and macroinvertebrates have not been evaluated through CSLAP in Black Pond, and the composition of the fish community is not known. Fluoroprobe (raw water) samples show very high algae levels, with the algae community mostly comprised of green algae. Very low blue green algae levels were measured, suggesting a low likelihood of a blue green algae bloom despite the high nutrient levels. Biological conditions in the lake are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Lake Perception

Water quality assessments were less favorable than usual in 2015, consistent with higher algae levels (and despite water clarity that was close to normal). None of these indicators has exhibited any clear long-term trends. The physical condition of the lake is most often described as having “definite algae greenness, yellowness or brownness”, consistent with the high overall algae levels. Aquatic plants are not visible from the lake surface. Recreational conditions are most often described as “excellent” for most uses, despite the poor clarity. These assessments improve slightly in early summer in most years, but degraded over that period in 2015. Overall lake perception is summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Local Climate Change

Air and water temperature readings in the summer index period were close to normal in 2015, although water temperatures appear to have increased slightly in recent years. It is not yet known if this indicates local climate change or if this dataset is inadequate to evaluate these changes.

Evaluation of Algal Toxins

Algal toxin levels can vary significantly within blooms and from shoreline to lake, and the absence of toxins in a sample does not indicate safe swimming conditions. Fluoroprobe readings show very high algae levels but blue green algae levels well below the threshold for harmful algal blooms (HABs). Algal toxin levels are undetectable in nearly all samples. No shoreline blooms have been reported.

Lake Condition Summary

Category	Indicator	Min	Annual Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	0.15	0.35	0.55	0.33	Eutrophic	Within Normal Range	No Change
	Chlorophyll *a*	0.27	85.20	532.80	125.47	Eutrophic	Within Normal Range	Increasing Significantly
	Total Phosphorus	0.024	0.091	0.245	0.114	Eutrophic	Within Normal Range	No Change
Potable Water Indicators	Hypolimnetic Ammonia							Not known
	Hypolimnetic Arsenic							Not known
	Hypolimnetic Iron							Not known
	Hypolimnetic Manganese							Not known
Limnological Indicators	Hypolimnetic Phosphorus							Not known
	Nitrate + Nitrite	0.00	0.02	0.06	0.01	Low NOx	Lower Than Normal	Decreasing Slightly
	Ammonia	0.01	0.06	0.29	0.05	Low Ammonia	Within Normal Range	No Change
	Total Nitrogen	0.65	1.69	5.67	2.10	High Total Nitrogen	Within Normal Range	Increasing Slightly
	pH	5.65	6.89	8.85	6.60	Circumneutral	Within Normal Range	No Change
	Specific Conductance	15	48	84	58	Softwater	Within Normal Range	No Change
	True Color	10	81	247	80	Colored	Within Normal Range	No Change
	Calcium	0.1	1.5	4.7	1.1	Not Susceptible to Zebra Mussels	Within Normal Range	No Change
Lake Perception	WQ Assessment	1	2.5	4	3.0	Definite Algal Greenness	Within Normal Range	No Change
	Aquatic Plant Coverage	1	1.0	1	1.0	Plants Not Visible	Within Normal Range	No Change
	Recreational Assessment	1	2.3	4	2.4	Excellent	Within Normal Range	No Change
Biological Condition	Phytoplankton					Open water-low blue green algae biomass	Not known	Not known
	Macrophytes					Not available through CSLAP	Not known	Not known
	Zooplankton					Not available through CSLAP	Not known	Not known
	Macroinvertebrates					Not available through CSLAP	Not known	Not known
	Fish					Not available through CSLAP	Not known	Not known
	Invasive Species					None observed	Not known	Not known
Local Climate Change	Air Temperature	14	23.1	33	23.4		Within Normal Range	No Change
	Water Temperature	10	24.1	31	24.9		Within Normal Range	No Change
Harmful Algal Blooms	Open Water Phycocyanin	10	90	933	18	Some readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a	10	100	185	120	Most readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	0	0	0	No readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	<DL	<DL	0.5	<DL	Low to undetectable open water MC-LR	Not known	Not known
	Open Water Anatoxin a	<DL	<DL	<DL	<DL	Open water Anatoxin-a consistently not detectable	Not known	Not known
	Shoreline Phycocyanin					No shoreline blooms sampled for PC	Not known	Not known
	Shoreline FP Chl.a					No shoreline blooms sampled for FP	Not known	Not known
	Shoreline FP BG Chl.a					No shoreline blooms sampled for FP	Not known	Not known
	Shoreline Microcystis					No shoreline bloom MC-LR data	Not known	Not known
	Shoreline Anatoxin a					No shoreline bloom anatoxin data	Not known	Not known

Evaluation of Lake Condition Impacts to Lake Uses

Black Pond is not presently listed on the Atlantic Ocean / Long Island Sound PWL, last updated in 2002.

Potable Water (Drinking Water)

The CSLAP dataset at Black Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, is inadequate to evaluate the use of the lake for potable water, and the lake is not used for this purpose. The algae levels in the lake suggest that the "unofficial" potable water use would be severely compromised.

Public Bathing

The CSLAP dataset at Black Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that public bathing, if conducted at a public swimming beach, may be *impaired* by reduced water clarity, and elevated nutrient and algae levels, although additional information about bacterial levels is needed to evaluate the safety of the water for swimming. It should be noted that the lake presently does not support this use.

Recreation (Swimming and Non-Contact Uses)

The CSLAP dataset on Black Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that recreation would be *impaired* by poor water clarity and high algae levels, despite the lack of blue green algae blooms.

Aquatic Life

The CSLAP dataset on Black Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aquatic life may be *stressed* by depressed (and highly variable) pH and *threatened* by road salt runoff, although additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

Aesthetics and Habitat

The CSLAP dataset on Black Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics may be *poor* due to low water clarity and excessive algae. Habitat may be *good.*

Fish Consumption

There are no fish consumption advisories posted for Black Pond.

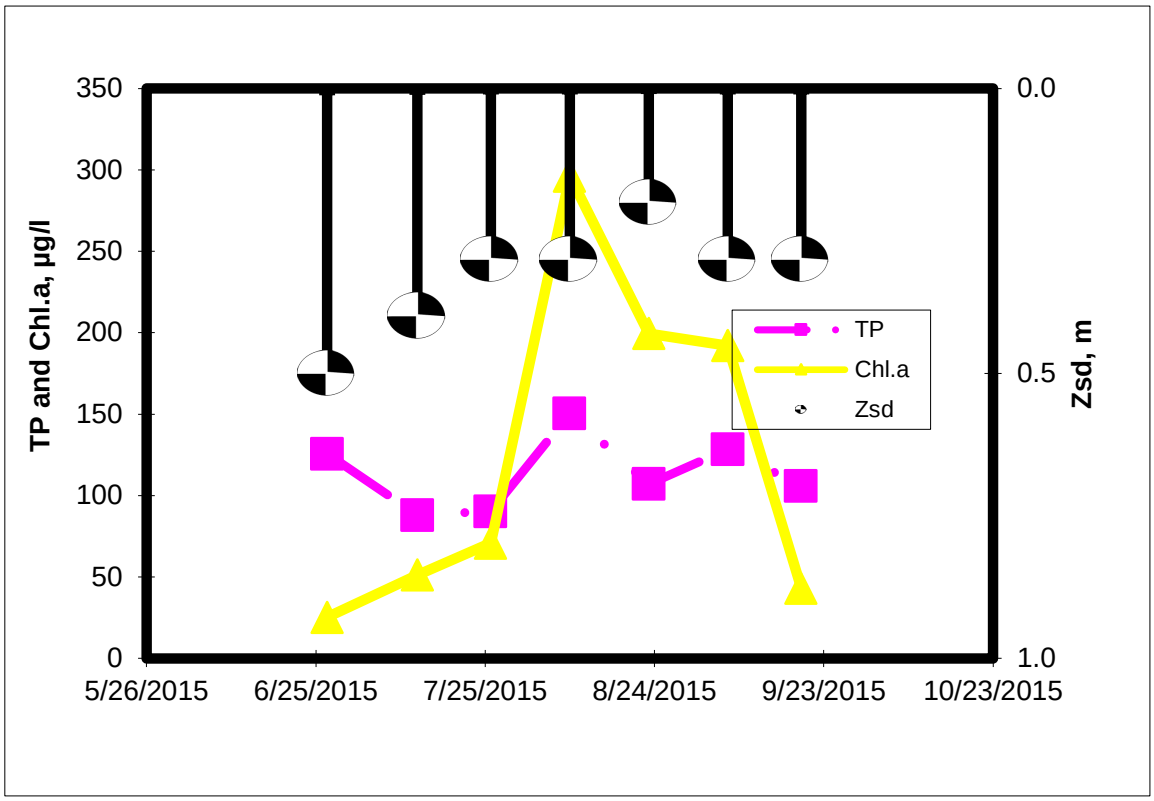
Additional Comments and Recommendations

Aquatic plant monitoring in Black Pond will help to determine if the plant community is more strongly affected by native or invasive plants, particularly fanwort (*Cabomba caroliniana*) and variable watermilfoil (*Myriophyllum heterophyllum*), exotic plant species commonly found in lakes near the Long Pond Greenbelt.

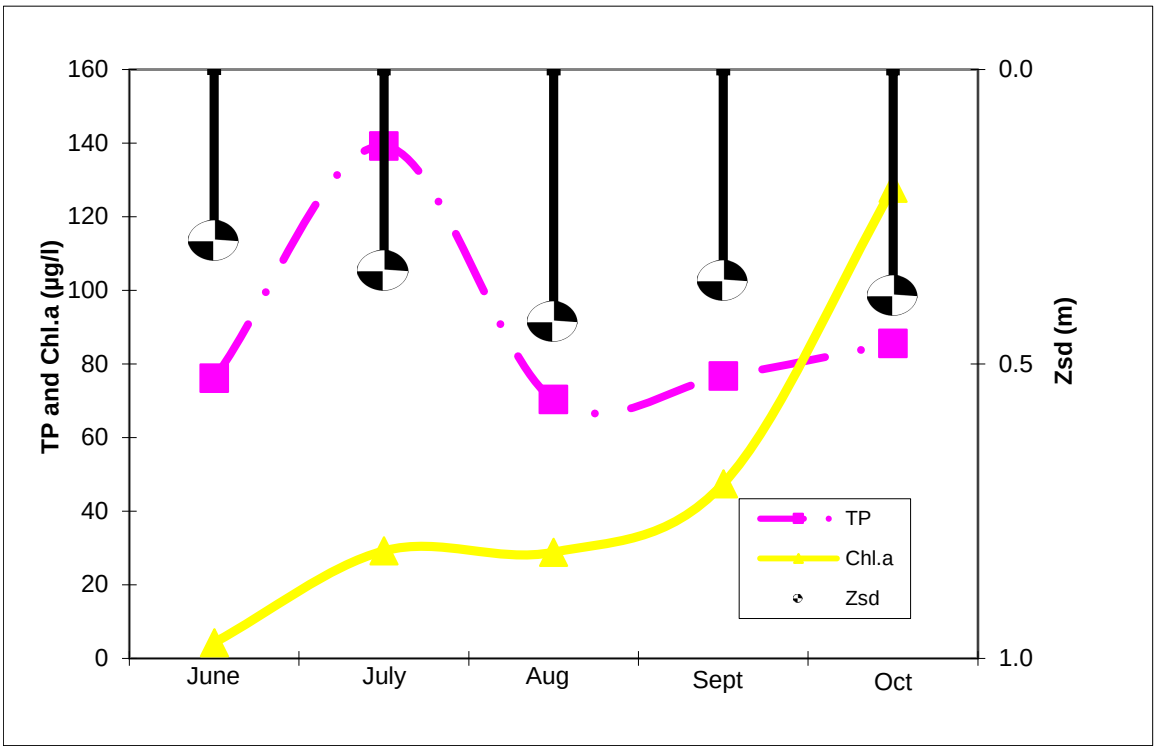
Aquatic Plant IDs-2015

None submitted for identification.

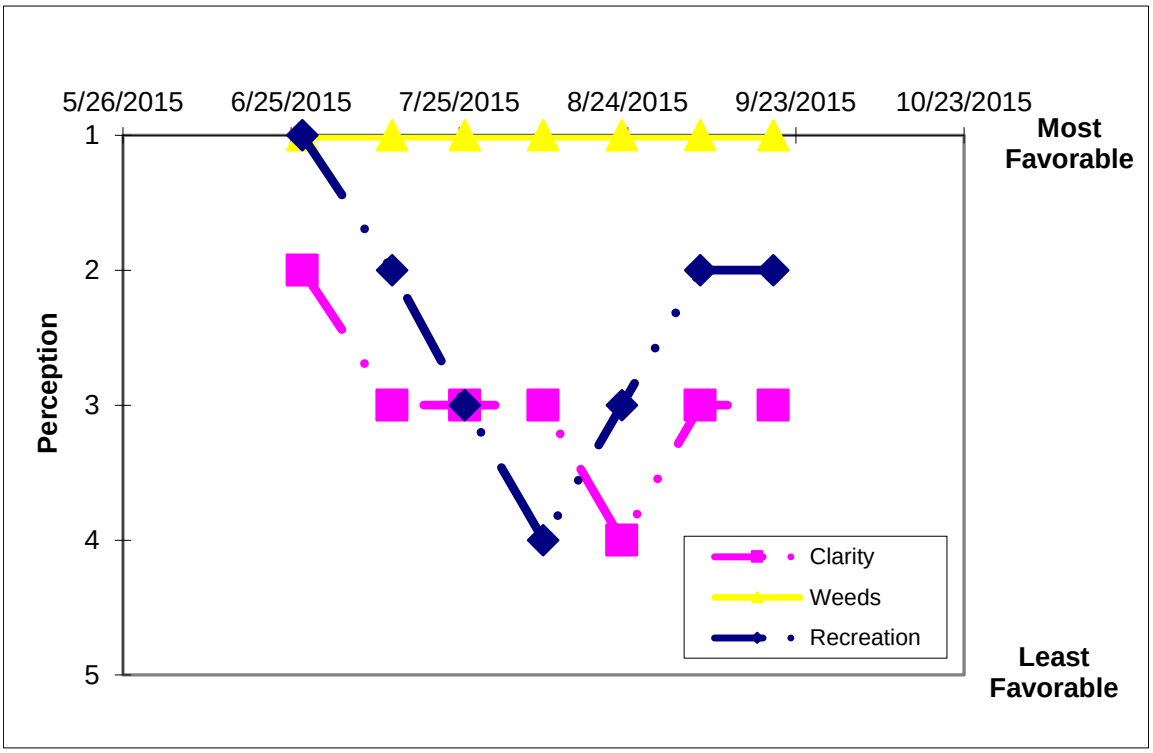
Time Series: Trophic Indicators, 2015



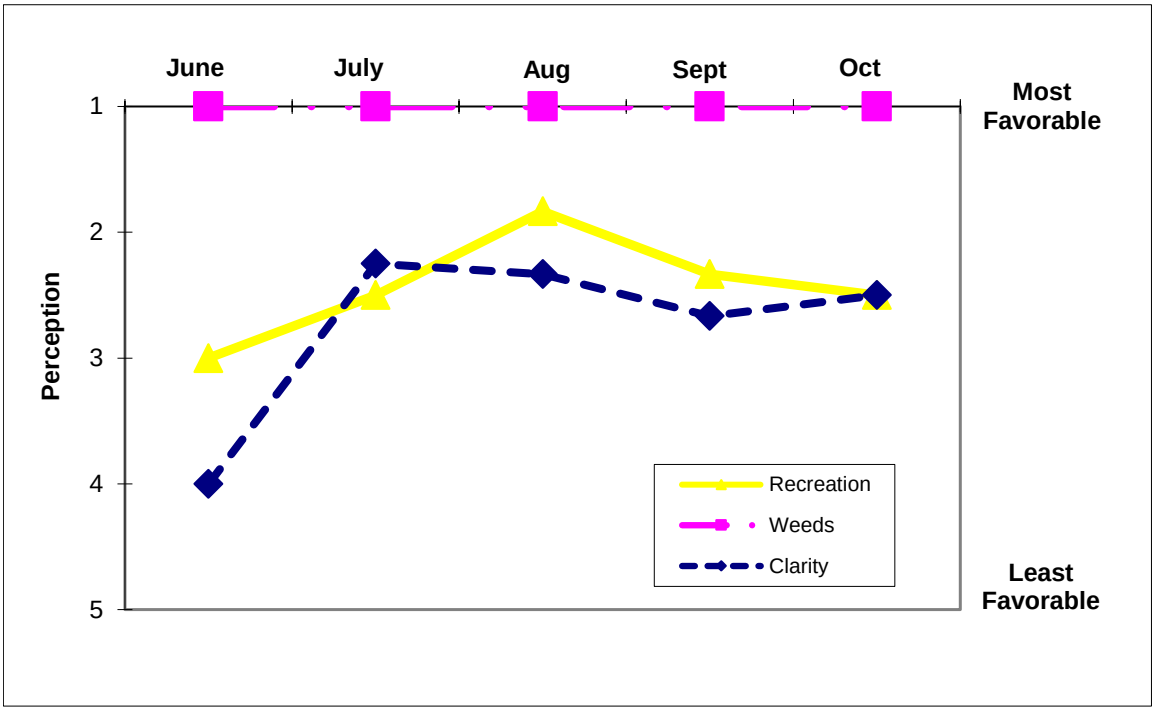
Time Series: Trophic Indicators, Typical Year (2008-2015)



Time Series: Lake Perception Indicators, 2015



Time Series: Lake Perception Indicators, Typical Year (2008-2015)



Appendix A- CSLAP Water Quality Sampling Results for Black Pond

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
217	Black Pond	7/12/2008		0.35	1.0	0.133	0.04	0.12	1.12	18.43		6.02	35	1.5	6.58	
217	Black Pond	7/25/2008		0.35	~1	0.245	0.02	0.10	1.91	17.12	247	6.03	27		4.46	
217	Black Pond	8/10/2008	1.00	0.34	0.8	0.100	0.01	0.10	0.95	20.89	37	6.67	38		19.08	
217	Black Pond	9/1/2008	1.00	0.35	1.0	0.125	0.01	0.03	2.13	37.52	42	6.15	33		95.58	
217	Black Pond	10/11/2008	1.00	0.53	0.5	0.054	0.01	0.23	1.22	49.55	129	7.84	24	0.6	0.27	
217	Black Pond	07/11/2009	1.0	0.27	0.9	0.084	0.03	0.03	1.27	33.36	105	6.64	32	0.6	62.00	
217	Black Pond	07/26/2009	1.5	0.41	1.0	0.095	0.04	0.07	1.68	38.85	75	6.99	42		43.84	
217	Black Pond	08/03/2009	1.5	0.48	1.0	0.078	0.02	0.03	1.23	34.97	78	6.69	30		22.93	
217	Black Pond	08/11/2009	1.4	0.48	1.4	0.044	0.01	0.06	1.38	68.80	85	7.21	32		10.80	
217	Black Pond	08/23/2009	1.4	0.53		0.063	0.02	0.02	0.97	33.85	76	5.65	35	0.1	39.90	
217	Black Pond	09/13/2009	1.0	0.48		0.058	0.01	0.02	1.20	45.83	51	7.02	28		34.90	
217	Black Pond	09/20/2009	1.3	0.41		0.082	0.02	0.03	1.54	41.29	91	7.17	30		15.40	
217	Black Pond	09/27/2009	1.4	0.34	1.0	0.072	0.01	0.04	1.29	39.45	41	7.79	15		60.50	
217	Black Pond	5/31/2010	2.2	0.35	1.5	0.075	0.01	0.05	1.09	32.07	222	5.88	84		196.20	
217	Black Pond	6/27/2010	2.0	0.29	1.5	0.076	0.03	0.05	0.98	28.24	166	6.20	60		4.30	
217	Black Pond	8/3/2010	0.6	0.40	1.0	0.066	0.02	0.03	0.86	28.72	68	6.36	59		68.70	
217	Black Pond	8/15/2010	1.5	0.35	1.0	0.071	0.04	0.05	0.83	25.79	37	8.05	66	1.8	11.80	
217	Black Pond	9/6/2010	1.5	0.29	1.0	0.050	0.01	0.02			102	6.03	56	2.3	11.70	
217	Black Pond	9/19/2010	1.5	0.29	1.0	0.074	0.05	0.03	0.65	19.32	38	8.07	73		67.00	
217	Black Pond	10/2/2010	1.4	0.25		0.117	0.01	0.29	1.16	21.91	42	7.09	57		255.40	
217	Black Pond	6/12/2011	1.3	0.50	1.0	0.058	0.05	0.22	0.96	36.55	142	6.66	49.4	4.7	2.20	
217	Black Pond	6/25/2011	1.2	0.43	0.9	0.105	0.01	0.02	1.05	21.94	139	6.79	46.6		5.40	
217	Black Pond	7/10/2011	1.2	0.48	1.0	0.063	0.01	0.11	1.19	41.42	56	6.31	50.6		21.10	
217	Black Pond	7/24/2011	1.0	0.51	0.9	0.072	0.01	0.05	1.18	36.08	72	7.26	59.8		13.50	
217	Black Pond	8/7/2011	1.0	0.40	0.9	0.103	0.01	0.06	2.00	42.53	45	8.27	46.2	2.4	82.80	
217	Black Pond	8/21/2011	1.1	0.28	0.8	0.082	0.01	0.03	1.75	46.62	54	7.59	44.4		98.60	
217	Black Pond	9/5/2011	0.9	0.25	0.8	0.145	0.02	0.03	2.16	32.75	41	8.85	71.8			
217	Black Pond	9/11/2011	0.9	0.34	0.8	0.065	0.03	0.05	2.40	80.86	42	7.39	44.8		22.60	
217	Black Pond	6/24/2012	1.0	0.45	0.5	0.059	0.06	0.14	1.53	56.98	70	7.78	52.4	0.6	19.70	
217	Black Pond	7/15/2012	0.9	0.46	0.5	0.084	0.01	0.02	1.25	32.74	95	6.38	39.6		4.00	
217	Black Pond	7/22/2012	0.7	0.35	0.5	0.101	0.01	0.04	1.51	33.10	94	7.68	37.2		10.80	
217	Black Pond	7/31/2012	0.8	0.31	0.3	0.100	0.01	0.03	1.73	38.20	80	6.87	44.9		107.30	
217	Black Pond	8/6/2012	0.6	0.27	0.3	0.024	0.01	0.02	1.51	138.54	79	6.36	39.4	0.6	177.10	
217	Black Pond	8/19/2012	0.6	0.32	0.3	0.041	0.01	0.04	1.80	96.59	55	8.72	50.1		184.70	
217	Black Pond	9/3/2012	0.5	0.21	0.3	0.099	0.01	0.05	3.01	67.03	55	7.5	52.9		532.80	
217	Black Pond	9/22/2012	0.4	0.15	0.3	0.125	0.01	0.07	5.67	99.60	43	7.08	53.4		383.60	
217	Black Pond	6/2/2013	0.9	0.55	0.7	0.111	0.06	0.03	2.25	44.54	122	6.47	54.6	2.0	15.30	
217	Black Pond	6/18/2013	0.9	0.29	0.9	0.110			2.42	48.26	117	6.08	43.6		51.20	
217	Black Pond	6/30/2013	1.0	0.30	0.5	0.079	0.01	0.03	2.28	63.79	10	7.16	49.9		31.70	
217	Black Pond	7/14/2013	1.0	0.30	0.5	0.044			1.86	93.70	93	7.13	49.4		96.80	
217	Black Pond	7/29/2013	0.9	0.28	0.5	0.102	0.01	0.02	2.09	45.01	73	6.93	51.6		53.80	
217	Black Pond	8/18/2013	1.0	0.25	0.5	0.129			2.14	36.61	95	6.66	55.2		156.40	
217	Black Pond	9/1/2013	0.7	0.27	0.5	0.108	0.01	0.01	1.54	31.58	58	5.72	57.2		168.70	
217	Black Pond	9/15/2013	0.7	0.30	0.5	0.096			1.20	27.42	46	5.94	42		110.20	
217	Black Pond	6/27/2015	1.1	0.50	1.0	0.126	0.02	0.09	1.28	10.16	70	6.92	48	1.3	25.20	
217	Black Pond	7/13/2015	0.9	0.40	0.8	0.088			2.02	22.92	95	7.24	54		51.20	
217	Black Pond	7/26/2015	0.9	0.30	0.5	0.090	0.01	0.02	2.11	23.33	190	7.20	54		70.90	12.6
217	Black Pond	8/9/2015	0.7	0.30	0.5	0.151			2.95	19.57	85	6.13	64		296.20	
217	Black Pond	8/23/2015	0.7	0.20	0.5	0.107	0.02	0.07	2.43	22.73	47	5.81	64	1.0	199.50	
217	Black Pond	9/6/2015	0.5	0.30	0.3	0.129			2.76	21.45	40	5.70	65		192.10	
217	Black Pond	9/19/2015	0.6	0.30	0.4	0.106	0.00	0.04	1.18	11.10	35	7.19	54		43.20	13.6

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB form	Shore HAB
217	Black P	7/12/2008	epi	23	28	3	1	3	18											
217	Black P	7/25/2008	epi	27	10	1	1	2	8											
217	Black P	8/10/2008	epi	25	25	2	1	1	8											
217	Black P	9/1/2008	epi	20	23	2	1	1	18											
217	Black P	10/11/2008	epi	16	17	2	1	2	18											
217	Black P	07/11/2009	epi	24	21	2	1	2	1											
217	Black P	07/26/2009	epi	25	21	3	1	3	1											
217	Black P	08/03/2009	epi	26	27	2	1	2	1											
217	Black P	08/11/2009	epi	24	29	2	1	1	0											
217	Black P	08/23/2009	epi	26	30	2	1	2	0											
217	Black P	09/13/2009	epi	21	23	3	1	3	1											
217	Black P	09/20/2009	epi	26	21	3	1	3	1			165.7								
217	Black P	09/27/2009	epi	21	19	2	1	2	0			94.62								
217	Black P	5/31/2010	epi	23	26	4	1	4	13	0	0									
217	Black P	6/27/2010	epi	24	26	4	1	3	13	4	4									
217	Black P	8/3/2010	epi	33	28	3	1	3	16	0	0									
217	Black P	8/15/2010	epi	25	26	3	1	2	1	0	0									
217	Black P	9/6/2010	epi	19	22	3	1	3	1	0	0	932.5								
217	Black P	9/19/2010	epi	19	22	3	1	2	1	0	0									
217	Black P	10/2/2010	epi	16	20	3	1	3	1	0	0									
217	Black P	6/12/2011	epi	17	22	1	1	2	5	0	0	11.90	9.20							
217	Black P	6/25/2011	epi	21	23	1	1	2	0	0	0	32.00	22.00							
217	Black P	7/10/2011	epi	24	30	1	1	2	0	0	0	42.30	14.80							
217	Black P	7/24/2011	epi	28	29	1	1	2	0	0	0	32.80	23.23	0.28	<0.400	<0.1				
217	Black P	8/7/2011	epi	29	29	2	1	2	5	0	0	165.1	208.5	0.57	<0.500	<0.1			i	
217	Black P	8/21/2011	epi	29	27	2	1	1	0	0	0	147.0	190.2	0.15					i	
217	Black P	9/5/2011	epi	27	25	3	1	2	0	0	0	147.5	199.8						i	
217	Black P	9/11/2011	epi	20	22	2	1	2	0	0	0	233.3	325.5						i	
217	Black P	6/24/2012	epi	24	31	3	1	2	1	0	0								I	
217	Black P	7/15/2012	epi	31	29	3	1	4	18	0	0								I	
217	Black P	7/22/2012	epi	23	26	2	1	2	0	0	0								I	
217	Black P	7/31/2012	epi	22	24	2	1	2	0	0	0								F	
217	Black P	8/6/2012	epi	26	29	2	1	2	1	0	0								F	
217	Black P	8/19/2012	epi	21	23	2	1	2	1	0	0								I	
217	Black P	9/3/2012	epi	18	17	3	1	4	1	4	4								F	
217	Black P	9/22/2012	epi	14	16	3	1	2	1	0	0								I	
217	Black P	6/2/2013	epi	27	24	3	1	2	16	0	0	9.50	14.60	<0.30	<0.630		9.90	0.00	I	I
217	Black P	6/18/2013	epi	16	17	3	1	2	1	0	0	16.60	42.80	<0.30	<0.440		43.00	0.00	I	I
217	Black P	6/30/2013	epi	25	25	3	1	2	1	0	0	12.60	46.40	<0.30	<0.650		42.30	0.00	I	I
217	Black P	7/14/2013	epi	29	27	3	1	2	1	0	0	17.00	145.2	<0.30	<0.490		145.4	0.00	F	F
217	Black P	7/29/2013	epi	23	30	3	1	2	1	0	0	12.00	27.90	<0.30	<0.380		51.70	0.00	F	F
217	Black P	8/18/2013	epi	21	25	3	1	2	1	0	0	24.40	154.2	<0.30	<0.510		175.7	0.00	F	F
217	Black P	9/1/2013	epi	24	24	3	1	2	1	0	0	18.90	148.2	<0.30	<1.100		132.6	0.00	F	F
217	Black P	9/15/2013	epi	15	19	3	1	2	1	0	0	22.30	70.40	<0.30	<1.240		76.0	0.00	F	F
217	Black P	6/27/2015	epi	20	24	2	1	1	0	0	0	10.90	5.10	<1.01	<0.007	<0.000	21.50	0.00	I	I
217	Black P	7/13/2015	epi	20	25	3	1	2	0	0	0	14.10	15.20	<0.76	<0.005	<0.028	52.69	0.00	I	I
217	Black P	7/26/2015	epi	26	28	3	1	3	15	4	4	19.50	57.60	<0.30	<0.002	<0.014	176.34	0.00	F	I
217	Black P	8/9/2015	epi	23	25	3	1	4	1	0	0	31.90	43.30	<0.18	<0.002	<0.009	185.18	0.00	I	I
217	Black P	8/23/2015	epi	26	26	4	1	3	1	0	0	17.60	1.80	<0.21	<0.003	<0.010	181.34	0.00	I	I
217	Black P	9/6/2015	epi	24	21	3	1	2	1	0	0	16.50	14.20	<0.30	<0.007	<0.035	100.82	0.00	I	I
217	Black P	9/19/2015	epi	25	25	3	1	2	1	0	0			<0.39	<0.018	<0.025			I	I

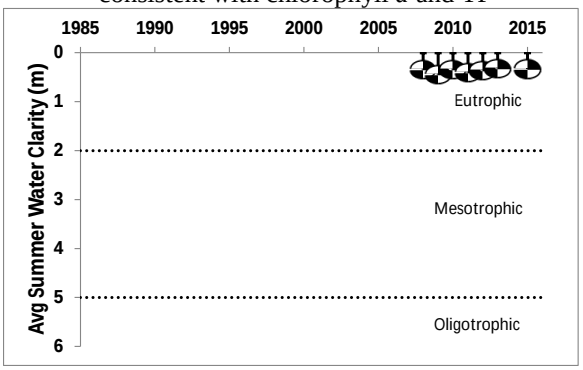
Legend Information

Indicator	*Description*	*Detection Limit*	*Standard (S) / Criteria (C)*
General Information			
Lnum	lake number (unique to CSLAP)		
Lname	name of lake (as it appears in the Gazetteer of NYS Lakes)		
Date	sampling date		
Field Parameters			
Zbot	lake depth at sampling point, meters (m)		
Zsd	Secchi disk transparency or clarity	0.1m	1.2m (C)
Zsamp	water sample depth (m) (epi = epilimnion or surface; bot = bottom)	0.1m	none
Tair	air temperature (C)	-10C	none
TH20	water temperature (C)	-10C	none
Laboratory Parameters			
Tot.P	total phosphorus (mg/l)	0.003 mg/l	0.020 mg/l (C)
NOx	nitrate + nitrite (mg/l)	0.01 mg/l	10 mg/l NO3 (S), 2 mg/l NO2 (S)
NH4	total ammonia (mg/l)	0.01 mg/l	2 mg/l NH4 (S)
TN	total nitrogen (mg/l)	0.01 mg/l	none
TN/TP	nitrogen to phosphorus (molar) ratio, = (TKN + NOx)*2.2/TP		none
TCOLOR	true (filtered) color (ptu, platinum color units)	1 ptu	none
pH	powers of hydrogen (S.U., standard pH units)	0.1 S.U.	6.5, 8.5 S.U. (S)
Cond25	specific conductance, corrected to 25C (umho/cm)	1 umho/cm	none
Ca, Cl	calcium, chloride (mg/l)	1 mg/l	none
Chl.a	chlorophyll a (ug/l)	0.01 ug/l	none
Fe	iron (mg/l)	0.1 mg/1	1.0 mg/l (S)
Mn	manganese (mg/l)	0.01 mg/l	0.3 mg/l (S)
As	arsenic (ug/l)	1 ug/l	10 ug/l (S)
AQ-PC	Phycocyanin (aquaflor) (unitless)	1 unit	none
AQ-Chl	Chlorophyll *a* (aquaflor) (ug/l)	1 ug/l	none
MC-LR	Microcystis-LR (ug/l)	0.01 ug/l	1 ug/l potable (C) 20 ug/l swimming (C)
Ana	Anatoxin-a (ug/l)	0.3 ug/l	none
Cyl	Cylindrospermposin (ug/l)	0.1 ug/l	none
Lake Assessment			
QA	water quality assessment; 1 = crystal clear, 2 = not quite crystal clear, 3 = definite algae greenness, 4 = high algae levels, 5 = severely high algae levels		
QB	aquatic plant assessment; 1 = no plants visible, 2 = plants below surface, 3 = plants at surface, 4 = plants dense at surface, 5 = surface plant coverage		
QC	recreational assessment; 1 = could not be nicer, 2 = excellent, 3 = slightly impaired, 4 = substantially impaired, 5 = lake not usable		
QD	reasons for recreational assessment; 1 = poor water clarity, 2 = excessive weeds, 3 = too much algae, 4 = lake looks bad, 5 = poor weather, 6 = litter/surface debris, 7 = too many lake users, 8 = other		
QF, QG	Health and safety issues today (QF) and past week (QG); 0 = none, 1 = taste/odor, 2 = GI illness humans/animals, 3 = swimmers itch, 4 = algae blooms, 5 = dead fish, 6 = unusual animals, 7 = other		
HAB form, Shore HAB	HAB evaluation; A=spilled paint, B=pea soup, C=streaks, D=green dots, E=bubbling scum, F=green/brown tint, G=duckweed, H=other, I=no bloom		

Appendix C- Long Term Trends: Black Pond

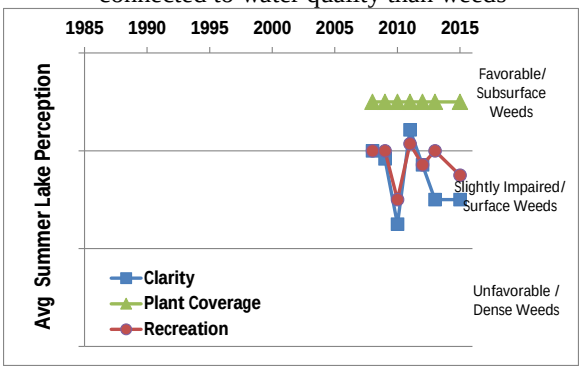
Long Term Trends: Water Clarity

- No long term trends apparent
- Most readings typical of *eutrophic* lakes, consistent with chlorophyll *a* and TP



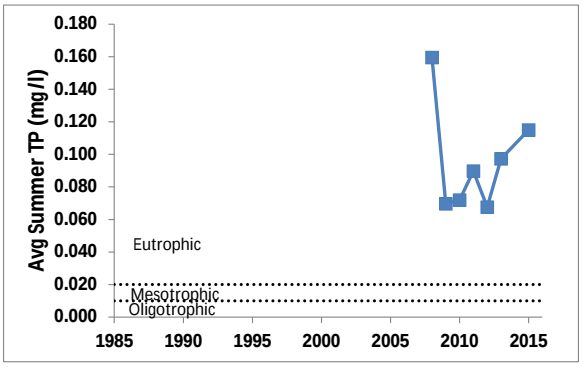
Long Term Trends: Lake Perception

- Variable lake perception
- Recreational perception more closely connected to water quality than weeds



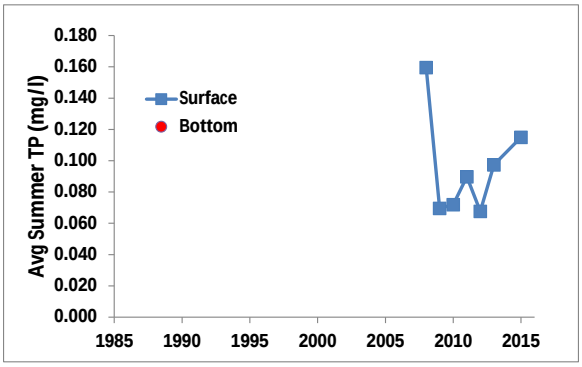
Long Term Trends: Phosphorus

- No long term trend apparent; highly variable
- Most readings typical of *eutrophic* lakes



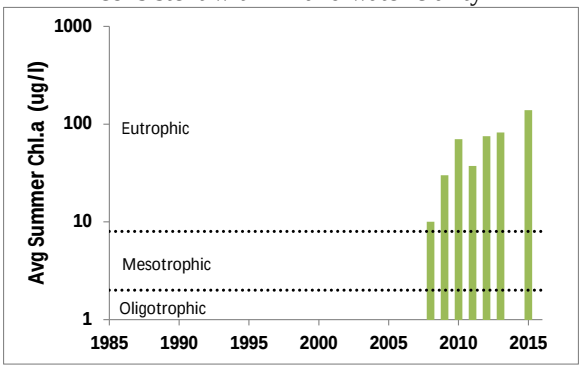
Long Term Trends: Bottom Phosphorus

- No deepwater TP readings
- Likely that surface and TP readings are similar in shallow lakes like Black Pond



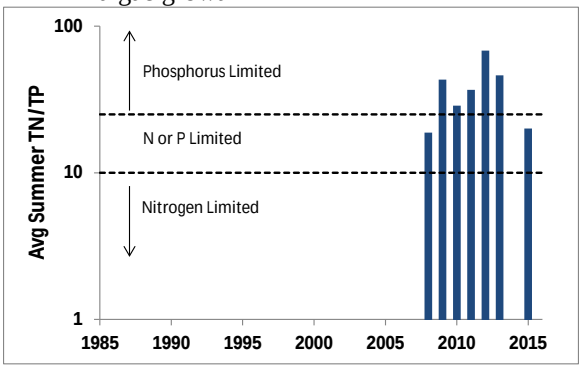
Long Term Trends: Chlorophyll a

- Increasing algae levels since late 2000s
- Most readings typical of *eutrophic* lakes, consistent with TP and water clarity



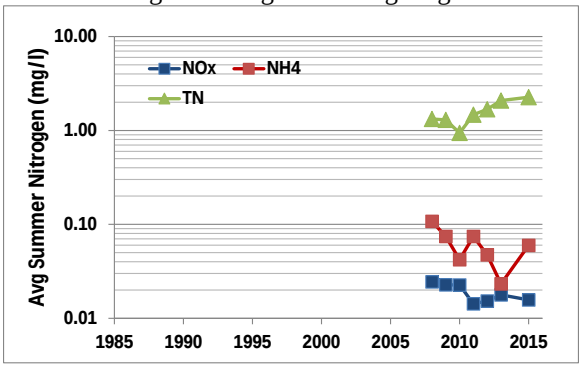
Long Term Trends: N:P Ratio

- Variable N:P ratios
- Most readings indicate phosphorus limits algae growth



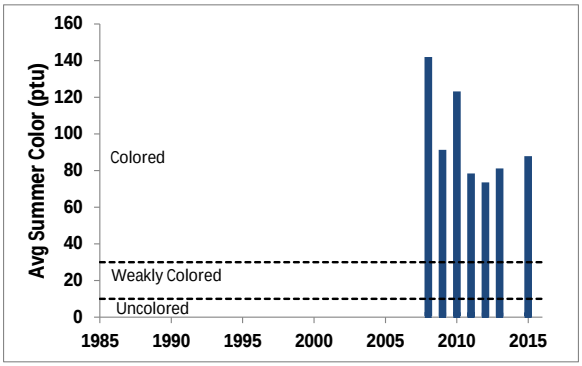
Long Term Trends: Nitrogen

- TN ↑; NOx and ammonia readings ↓?
- Low NOx and ammonia; higher total nitrogen readings due to high algae levels



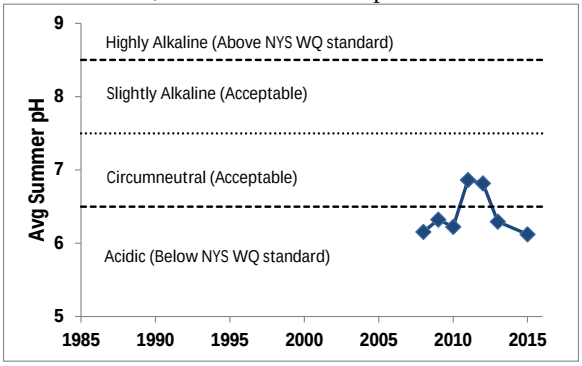
Long Term Trends: Color

- Decreasing color, but no statistical trend
- Most readings typical of *highly colored* lakes



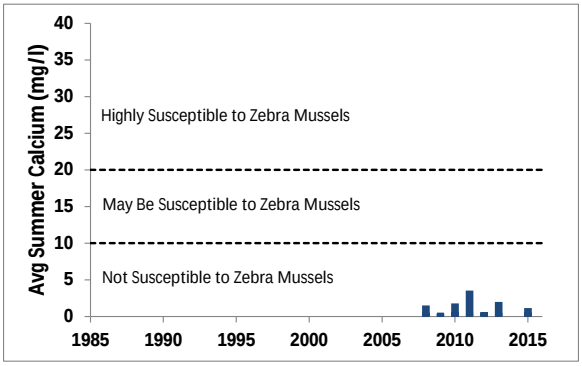
Long Term Trends: pH

- Slightly variable year to year
- Most readings now typical of *circumneutral* lakes, but occasional low pH



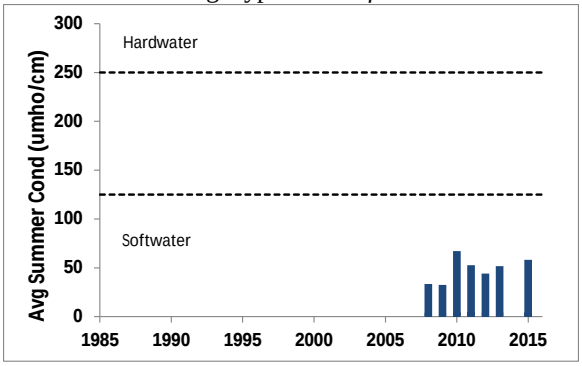
Long Term Trends: Calcium

- No long term trend; all low readings
- All readings indicate low susceptibility to zebra mussels



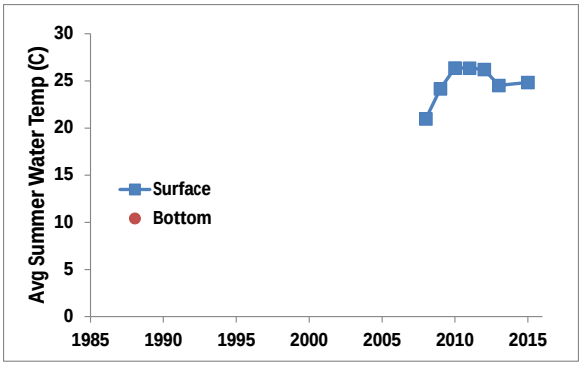
Long Term Trends: Conductivity

- Perhaps slight increase in conductivity, although all readings are low
- All readings typical of *softwater* lakes



Long Term Trends: Water Temperature

- Increasing temperature
- Surface and bottom temperatures similar in shallow lakes



Appendix D:
Algae Testing Results from SUNY ESF Study

Most algae are harmless, naturally present, and an important part of the food web. However excessive algae growth can cause health, recreational, and aesthetic problems. Some algae can produce toxins that can be harmful to people and animals. High quantities of these algae are called harmful algal blooms (HABs). CSLAP lakes have been sampled for a variety of HAB indicators since 2008. This was completed on selected lakes as part of a NYS DOH study from 2008-2010. In 2011, enhanced sampling on all CSLAP lakes was initiated through an EPA-funded project that has continued through the current sampling season. This study has evaluated a number of HAB indicators as follows:

- Algae types - blue green, green, diatoms, and "other"
- Algae densities
- Microscopic analysis of bloom samples
- Algal toxin analysis

Some of these results are reported in other portions of these reports. This appendix the seasonal change in blue green algae, other algae types, and the primary algal toxin (microcystin-LR, a liver toxin). Analysis was completed on open water samples and, for some lakes, shoreline samples that were collected when visual evidence of blooms were apparent. Results are compared to the DEC criteria of 25-30 ug/l blue green chlorophyll a and 20 ug/l microcystin-LR (based on the World Health Organization (WHO) threshold for unsafe swimming conditions) and the WHO provisional criteria for long-term protection of treated water supplies (= 1 ug/l microcystin-LR). The data for algae types are drawn from a high end fluorometer used by SUNY ESF. While these results are useful for timely approximation of lake conditions, they are not as accurate as the total chlorophyll results measured as a regular part of CSLAP since 1986 in all open water samples. Therefore these results are used judiciously in the assessment of sampled waterbodies.

Two separate samples are evaluated. A sample is taken at the CSLAP sample point at the deepest point of the lake at every sample session. In addition, shoreline samples can be taken when a bloom is visible. It should be noted that shoreline conditions can vary significantly over time and from one location to another. The shoreline bloom sampling results summarized below are not collected as routinely as open water samples, and therefore represent snapshots in time. It is assumed that sampling results showing high blue green algae and/or toxin levels indicate that algae blooms may be common and/or widespread on these lakes. However, the absence of elevated blue green algae and toxin levels does not assure the lack of shoreline blooms on these lakes. Elevated open water readings may indicate a higher likelihood of shoreline blooms, but in some lakes, these shoreline blooms have not been (well) documented.

The results from these samples are summarized within the CSLAP report for the lake.

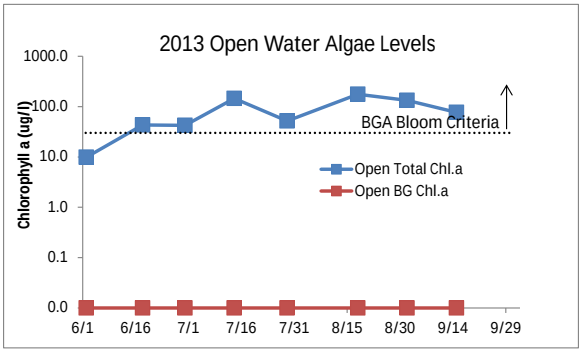


Figure D1:
2013 Open Water Total and BGA Chl.a

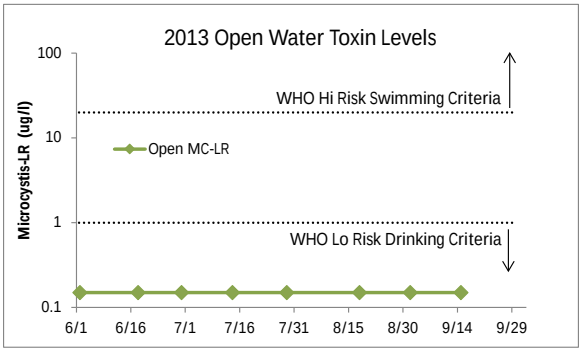


Figure D2:
2013 Open Water Microcystin-LR

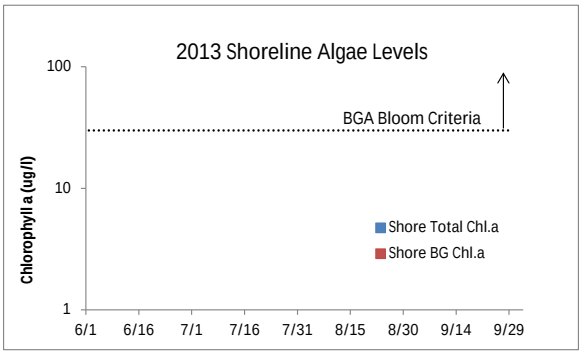


Figure D3:
2013 Shoreline Total and BGA Chl.a

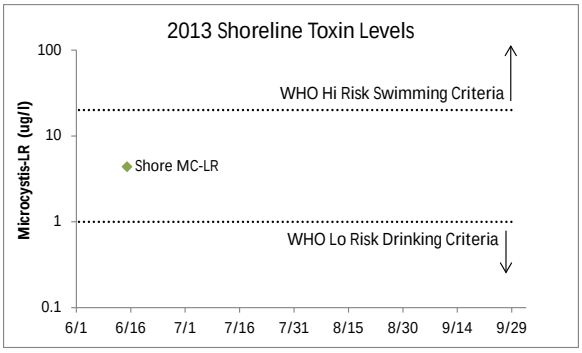


Figure D4:
2013 Shoreline Microcystin-LR

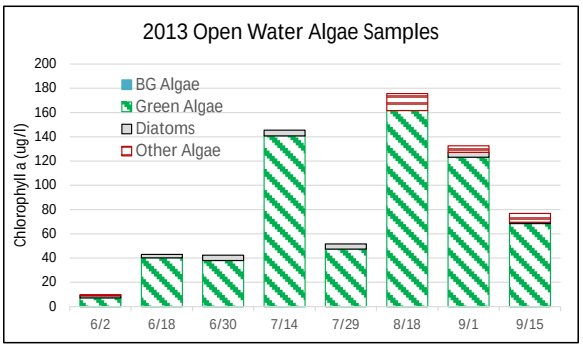


Figure D5:
2013 Open Water Algae Types

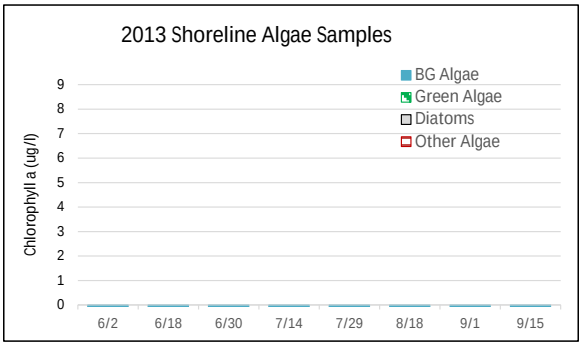


Figure D6:
2013 Shoreline Algae Types

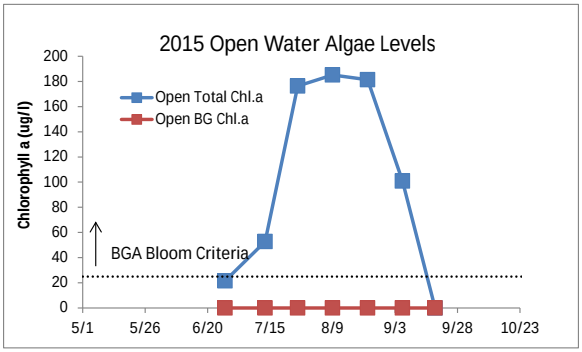


Figure D7:
2015 Open Water Total and BGA Chl.a

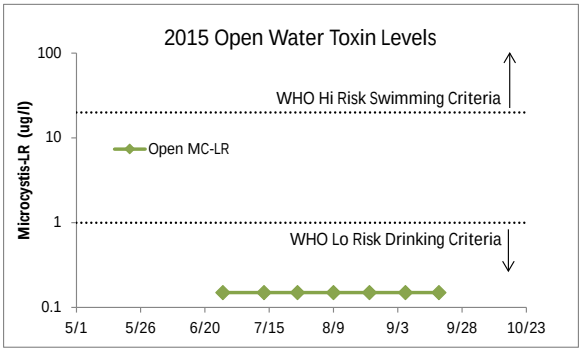


Figure D8:
2015 Open Water Microcystin-LR

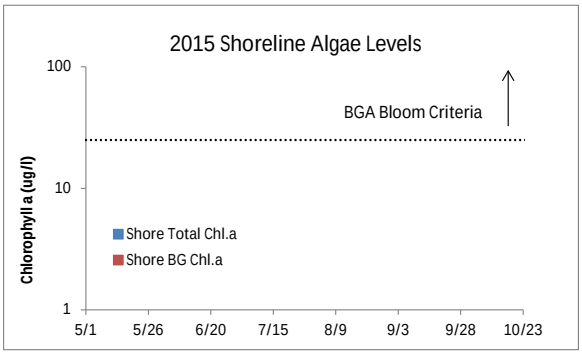


Figure D9:
2015 Shoreline Total and BGA Chl.a

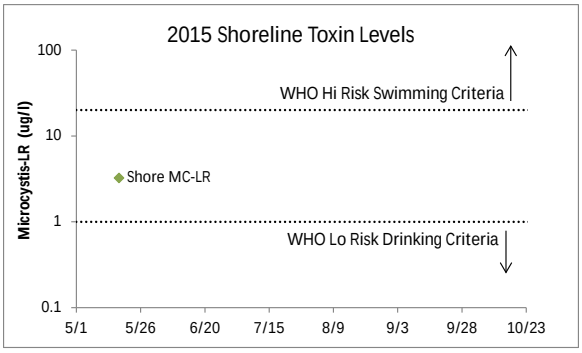


Figure D10:
2015 Shoreline Microcystin-LR

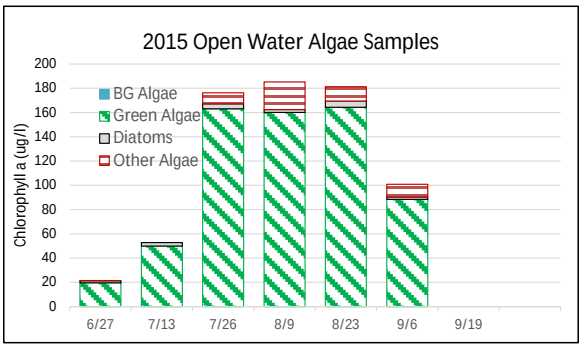


Figure D11:
2015 Open Water Algae Types

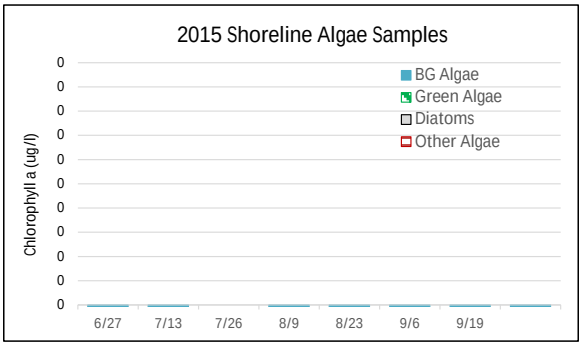


Figure D12:
2015 Shoreline Algae Types

Appendix E:
AIS Species in Suffolk County

The table below shows the invasive aquatic plants and animals that have been documented in Suffolk County, as cited in either the iMapInvasives database (http://www.imapinvasives.org/) or in the NYSDEC Division of Water database. These databases may include some, but not all, non-native plants or animals that have not been identified as "Prohibited and Regulated Invasive Species" in New York state regulations (6 NYCRR Part 575; http://www.dec.ny.gov/docs/lands_forests_pdf/islist.pdf).

This list is not complete, but instead represents only those species that have been reported and verified within the county. If any additional aquatic invasive species (AIS) are known or suspected in these or other waterbodies in the county, this information should be reported through iMap invasives or by contacting NYSDEC at dowinfo@dec.ny.gov.

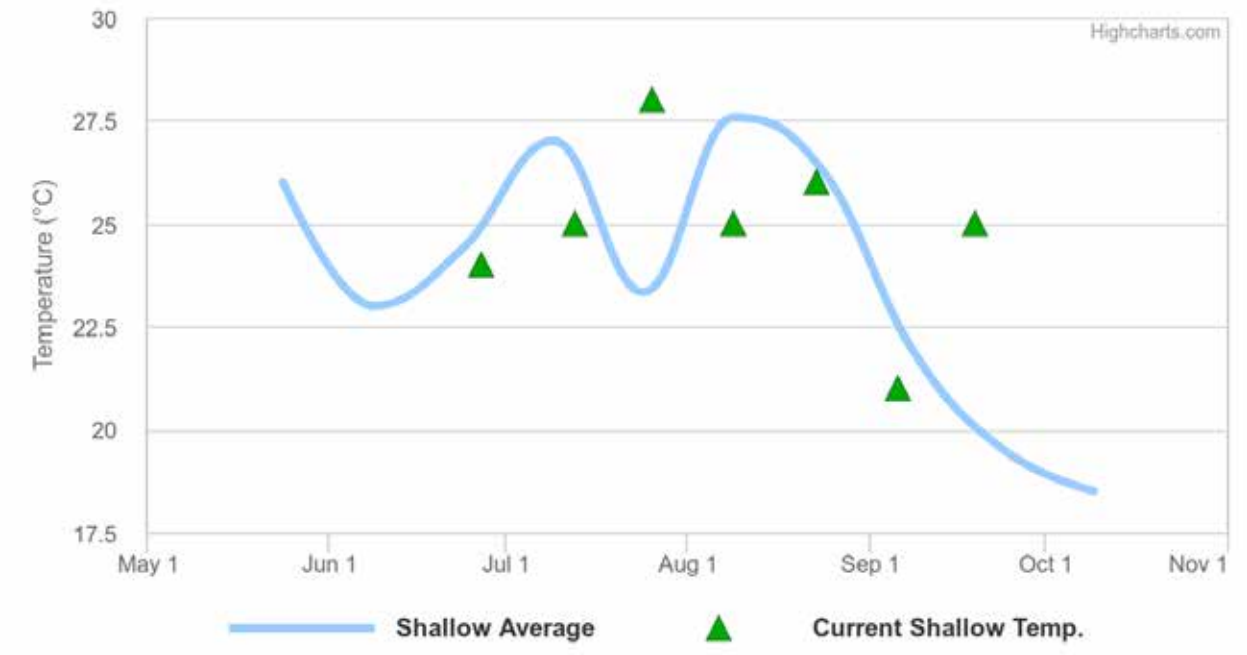
Aquatic Invasive Species - Suffolk County			
Waterbody	**Kingdom**	**Common name**	**Scientific name**
Artist Lake	Plant	Fanwort	*Cabomba caroliniana*
Artist Lake	Animal	Goldfish	*Carassius auratus*
Avon Manor Lake	Plant	Parrot feather	*Myriophyllum aquaticum*
Belmont Lake	Plant	Fanwort	*Cabomba caroliniana*
Belmont Lake	Animal	Common carp	*Cyprinus carpio*
Blydenburgh Pond aka New Mill Pond	Plant	Hydrilla	*Hydrilla verticillata*
Blydenburgh Pond aka New Mill Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Canaan Lake	Plant	Fanwort	*Cabomba caroliniana*
Canaan Lake	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Carlls River - Park Ave	Animal	Asian Clam	*Corbicula fluminea*
Donohue Pond	Plant	Fanwort	*Cabomba caroliniana*
Duck Pond	Plant	Fanwort	*Cabomba caroliniana*
Elda Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Fort Pond	Animal	Common carp	*Cyprinus carpio*
Great Patchogue Lake	Plant	Fanwort	*Cabomba caroliniana*
Great Patchogue Lake	Plant	Brazilian elodea	*Egeria densa*
Great Patchogue Lake	Plant	Hydrilla	*Hydrilla verticillata*
Great Patchogue Lake	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Hards Pond	Plant	Fanwort	*Cabomba caroliniana*
Knapps Lake	Plant	Parrot feather	*Myriophyllum aquaticum*
Lake Ronkonkoma	Animal	Goldfish	*Carassius auratus*
Lake Ronkonkoma	Animal	Common carp	*Cyprinus carpio*
Lake Ronkonkoma	Plant	Hydrilla	*Hydrilla verticillata*
Lake Ronkonkoma	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*

Waterbody	Kingdom	Common name	Scientific name
Lake Ronkonkoma	Plant	Brittle naiad	*Najas minor*
Little Fresh Pond	Plant	Fanwort	*Cabomba caroliniana*
Little Fresh Pond	Plant	Curly leafed pondweed	*Potamogeton crispus*
Little Long Pond	Plant	Fanwort	*Cabomba caroliniana*
Little Peconic Reservoir	Plant	Fanwort	*Cabomba caroliniana*
Long Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Lotus Lake	Plant	Fanwort	*Cabomba caroliniana*
Lotus Lake	Plant	Hydrilla	*Hydrilla verticillata*
Lotus Lake	Plant	European four leaf clover	*Marsilea quadrifolia*
Lotus Lake	Plant	Parrot feather	*Myriophyllum aquaticum*
Lotus Lake	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Lower Lake	Plant	Fanwort	*Cabomba caroliniana*
Lower Lake	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Lower Vail Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Lower Yaphank Lake	Plant	Fanwort	*Cabomba caroliniana*
Lower Yaphank Lake	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Massapequa Creek - North Soule	Animal	Asian Clam	*Corbicula fluminea*
Mill Pond - Islip	Plant	Curly leafed pondweed	*Potamogeton crispus*
Mill Pond - Oyster Bay	Plant	Water chestnut	*Trapa natans*
Millers Pond	Plant	Hydrilla	*Hydrilla verticillata*
New Millpond	Plant	Hydrilla	*Hydrilla verticillata*
New Millpond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Nissiquoge River - Smithtown	Animal	Asian Clam	*Corbicula fluminea*
Nissiquoge River - Caleb Smith SP	Animal	Asian Clam	*Corbicula fluminea*
Old Ice Pond	Plant	Brittle naiad	*Najas minor*
Peconic Lake	Plant	Fanwort	*Cabomba caroliniana*
Peconic Lake	Plant	Brazilian elodea	*Egeria densa*
Peconic Lake	Plant	European frogbit	*Hydrocharis morsus-ranae*
Peconic Lake	Plant	Floating primrose willow	*Ludwigia peploides ssp. glabrescens*
Peconic Lake	Plant	Parrot feather	*Myriophyllum aquaticum*
Peconic River	Plant	Floating primrose willow	*Ludwigia peploides ssp. glabrescens*
Phillips Mill Pond	Plant	Hydrilla	*Hydrilla verticillata*
Pine Lake	Plant	Brazilian elodea	*Egeria densa*
Pine Lake	Animal	Red-eared slider turtle	*Trachemys scripta elegans*
Randall Pond	Plant	Brazilian elodea	*Egeria densa*
Ross Pond	Plant	Parrot feather	*Myriophyllum aquaticum*
Sans Souci Lake	Plant	Hydrilla	*Hydrilla verticillata*
Sans Souci Lake	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Southards Pond	Plant	Fanwort	*Cabomba caroliniana*
Swan Pond	Plant	Fanwort	*Cabomba caroliniana*
Swan Pond	Plant	Water chestnut	*Trapa natans*

Waterbody	Kingdom	Common name	Scientific name
Swan Pond	**Plant**	**Hydrilla**	***Hydrilla verticillata***
Sweezy Pond	Plant	Fanwort	*Cabomba caroliniana*
Tarkill Pond	Animal	Chinese mystery snail	*Cipangopaludina chinensis*
Trout Pond	Plant	Fanwort	*Cabomba caroliniana*
Upper Lake	Plant	Fanwort	*Cabomba caroliniana*
Upper Vail Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Upper Yaphank Lake	Plant	Fanwort	*Cabomba caroliniana*
Vail Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Webster Pond	Plant	Fanwort	*Cabomba caroliniana*
Webster Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
West Brook Pond	Plant	Fanwort	*Cabomba caroliniana*
West Brook Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
West Lake	Plant	Fanwort	*Cabomba caroliniana*
Wildwood Lake	Plant	Fanwort	*Cabomba caroliniana*
Willow Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*

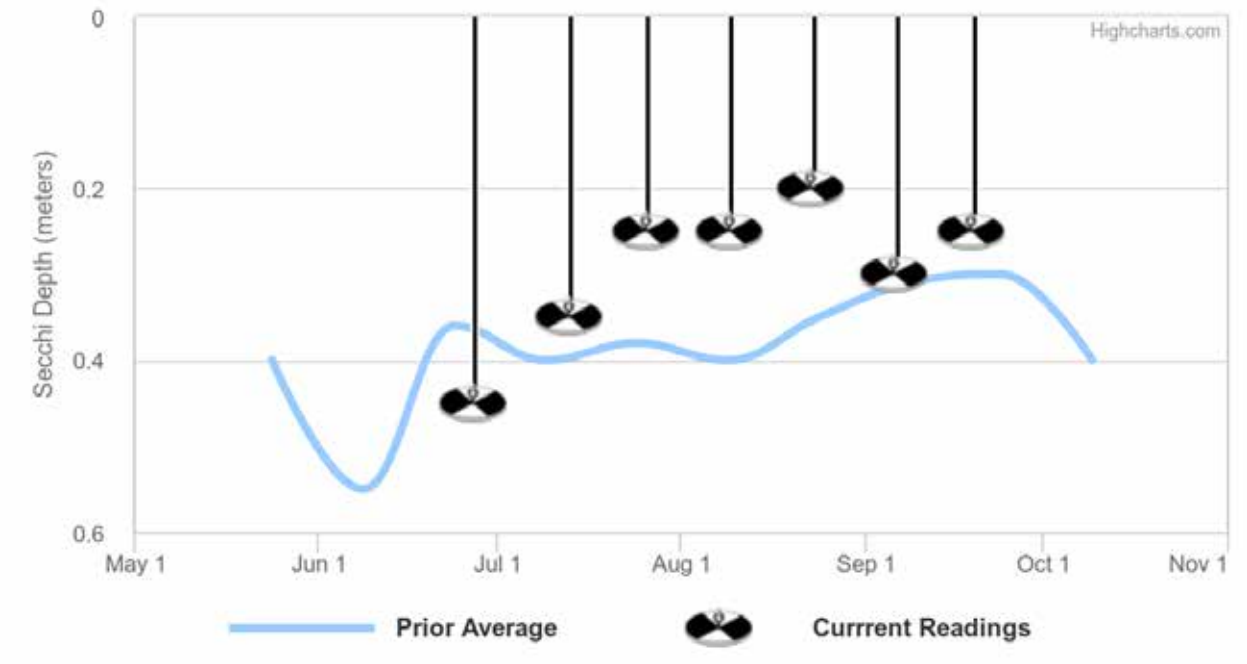
Appendix F: Current Year vs. Prior Averages for Black Pond

Current Year Water Temperatures vs. Prior Average



This year's shallow water sample temperatures are tending to be lower than normal when compared to the average of readings collected from 2008 to 2013.

Current Year Secchi Readings vs. Prior Average



This year's session Secchi readings are tending to be lower than normal when compared to the average of readings collected from 2008 to 2013

Appendix G: Watershed and Land Use Map for Black Pond

This watershed and land use map was developed using USGS StreamStats and ESRI ArcGIS using the 2006 land use satellite imagery. The actual watershed map and present land uses within this watershed may be slightly different due to the age of the underlying data and some limits to the use of these tools in some geographic regions and under varying flow conditions. However, these maps are intended to show the approximate extent of the lake drainage basin and the major land uses found within the boundaries of the basin.